

and MTOE) are independent (Enochs, Smith, & Huinker, 2000). The item total correlations of all items with the rest of the items was in the range from 0.43 to 0.53 for the PMTE-7, and from 0.46 to 0.64 for the MTOE. The Cronbach alpha for the MTEBI-12 is 0.742, while for the PMTE-7 it is 0.756 and for the MTOE-5 it is 0.765. Correlation with the original 21 item version of the MTEBI is $r=0.93$.

Conclusions

The main purpose of this study was to contribute to international research on evaluating the psychometric properties of the MTEBI. Confirmatory factor analysis suggested that the original two-factor model showed poor fit, but the re-specified 12-item model (with correlated errors) had acceptable levels of fit to the model. The MTEBI12 also showed good and acceptable reliability and internal consistency, both for the scale in general, and for the subscales. The results of confirmatory factor analysis and reliability analysis point out that MTEBI12 possesses adequate psychometric properties and construct validity, and that it is applicable to the sample of respondents in Serbia. The value of this study can be recognized in the fact that this is the first time that an instrument for assessing mathematics teaching efficacy beliefs was used in Serbia. Nevertheless, some further research work on examining validity and reliability of the MTEBI in Serbian educational settings is needed. The research on mathematics teaching efficacy beliefs has significance for educators involved in teacher education programmes who are constantly working on preparing future teachers to be able to teach mathematics effectively.

Acknowledgements

The authors would like to thank DeAnn Huinker for permission to use the research instrument MTEBI in their research.

References

- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1995). Exercise of personal and collective efficacy in changing societies. In A. Bandura (Ed.), *Self-efficacy in changing societies* (pp. 1–45). New York: Cambridge University Press.

- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.
- Bentler, P.M., & Wu, E.J.C. (2005). *EQS 6.1 for Windows user's Guide*. Encino, CA: Multi-variate Software.
- Bollen, K.A., & Stine, R.A. (1992). Bootstrapping goodness-of-fit measures in structural equation models. *Sociological Methods and Research*, 21(2), 205–229.
- Borko, H., & Putnam, R.T. (1996). Learning to teach. In D.C. Berliner and R.C. Calfee (Eds.), *Handbook of educational psychology* (pp. 673–708). New York: Macmillan.
- Brown, T.A. (2006). *Confirmatory factor analysis for applied research*. New York: Guilford Press.
- Byrne, B.M. (2010). *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming*. New York, NY: Routledge.
- Cetinkaya, B., & Erbas, A.K. (2011). Psychometric properties of the Turkish adaptation of the Mathematics Teacher Efficacy Belief Instrument for in-service teachers. *The Spanish Journal of Psychology*, 14(2), 956–966.
- Enochs, L.G., & Riggs, I.M. (1990). Further Development of an Elementary Science Teaching Efficacy Belief Instrument: A Preservice Elementary Scale. *School Science and Mathematics*, 90(8), 694–706.
- Enochs, L.G., Smith, P.L., & Huinker, D. (2000). Establishing factorial validity of the mathematics teaching efficacy instrument. *School Science and Mathematics*, 100(4), 194–202.
- Gavora, P. & Wiegerová, A. (2017). Self-efficacy of students in a pre-school education programme: the construction of a research instrument. *The New Educational Review*, 47(1), 125–138.
- Hu, L., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55.
- Kline, R.B. (2011). *Methodology in the Social Sciences. Principles and practice of structural equation modeling (3rd ed.)*. New York, NY: Guilford Press.
- Mardia, K.V. (1970). Measures of multivariate skewness and kurtosis with applications. *Biometrika*, 57(3), 519–530.
- Martins, M., Costa, J., & Onofre, M. (2015). Practicum experiences as sources of pre-service teachers' self-efficacy. *European Journal of Teacher Education*, 38(2), 263–279.
- Maasepp, B., & Bobis, J. (2014). Prospective primary teachers' beliefs about mathematics. *Mathematics Teacher Education and Development*, 16(2), 89–107.
- McGee, J.R., & Wang, C. (2014). Validity-supporting evidence of the self-efficacy for teaching mathematics instrument. *Journal of Psychoeducational Assessment*, 32(5), 390–403.
- Mihajlović, A. (2019). Increasing Pre-service Kindergarten Teachers' Mathematics Teaching Efficacy through Lesson Study. *The New Educational Review*, 55(1), 89–99.
- Mostofo, J. (2013). *Using lesson study with preservice secondary mathematics teachers: Effects on instruction, planning, and efficacy to teach mathematics* (Doctoral dissertation). Arizona State University, USA. Retrieved from <https://repository.asu.edu/items/16460>
- Nevitt, J., & Hancock, G.R. (2001). Performance of bootstrapping approaches to model test statistics and parameter standard error estimation in structural equation modeling. *Structural Equation Modeling*, 8(3), 353–377.

- Tabachnick, B.G., & Fidell, L.S. (2007). *Using Multivariate Statistics (5th ed.)*. New York: Allyn and Bacon.
- Takunyaci, M., & Takunyaci, M. (2014). Preschool teachers' mathematics teaching efficacy belief. *Procedia – Social and Behavioral Sciences*, 152, 673–678.
- Tschannen-Moran, M., & Hoy, A.W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education*, 17(7), 783–805.
- Wilhelm, A.G., & Berebitsky, D. (2019). Validation of the mathematics teachers' sense of efficacy scale. *Investigations in Mathematics Learning*, 11(1), 29–43.